NASA TechTracS

Detailed Design Document

Data Analysis/Preventative Maintenance Plan (Mod61)

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Data Analysis/Preventative Maintenance Plan (Mod61)

Introduction

This modification to NASA TechTracS was requested in a Work Request from Dianne Cheek of NASA Langley Research Center on 11/19/98 and is designated as Mod61.

It consists of a series of changes to forms and methods intended to reduce or eliminate the entry or use of illegal characters in the TechTracS data files. It also includes database administration guidelines for data validity monitoring.

This detailed design document contains sufficient information to complete the software development construction for Mod61. It also defines a quality assurance plan.

Design Overview

Reuse Strategy.

Little pre-existing TechTracS code or resources can be re-used in the performance of this modification. New methods will be developed in support of Work Request Requirement #4 and new data entry filters will be developed in support of Work Request Requirement #2.

Quality Assurance

In order to maintain high quality design and construction the following QA elements will be incorporated:

- All program code must adhere to defined standards, especially in the area of method, form and object naming conventions. Appendix B contains details of these conventions.

- All errors discovered during any formal testing will be recorded in the online Knowledge Sharing Systems Bug Reporting System. This will help to ensure that errors are not identified more than once and that they are properly resolved.

- Unit testing of discrete components will be performed by the developer. These components will be identified in the Detailed Development Plan. As far as is practicable, the goal of this testing is to prove that a given software component performs as designed before it is exposed to the larger environment of integration or system testing. For example, each method should be unit tested to verify proper use of passed parameters and, if appropriate, returned results.

- Developers will perform source code tracing where appropriate to prove that the code executes as expected. Research has shown that regular use of source code tracing and unit testing will identify many errors early in the development cycle. Errors identified early are more easily and more cost-effectively resolved.

- Component reviews will be conducted by the developer and an appointed reviewer, probably a fellow developer or technical supervisor depending on the complexity of the component and the skill level of the developer. A Component Review Checklist will be used to ensure consistent review quality. Once a component has passed its review, it may participate in integration testing. Part of the review will include an analysis of the component by scanning TechTracS source with SanityCheck from Foresight Solutions.

SanityCheck is an application that will perform a read-only scan of the 4th Dimension™ structure file. SanityCheck sifts through the structure file looking for common programming problems as well as checking the integrity of all objects (Forms, Methods, etc) within the structure file.

- Integration Testing will be conducted to ensure that all new or modified components perform as expected when combined with other elements of NASA TechTracS. Due to the integrated nature of the TechTracS development process, extensive, detailed integration testing is inappropriate. However, sufficient testing should be performed to ensure compatibility with other components of the system.

- System testing of this modification will be combined with testing of other modifications that are scheduled for the same release. A system test sequence will be developed to fully validate that the modifications have been properly implemented. After release, the system test sequence should be incorporated into regression test plans for future modifications.

User manual

An appendix will be developed for inclusion in a User manual that contains a description of the data entry filters implemented in TechTracS.

Design Status

⃠ A recommendation has been made for a set of approved characters than may be entered into alpha and text fields. The NASA team should approve the recommended set of characters. See *Table 1 - Approved ASCII Characters* on page 2.

Resolved April 12,1999: in discussion with Dianne Cheek it was decided to relax the limits on acceptable characters to those known to be suspect. The filters defined on page 2 have been updated to reflect this change.

Development/Operations Environment.

Modifications to TechTracS are required to be compatible with the following processors and operating systems:

- Intel Pentium – Windows 95, Windows NT 4
- Motorola PowerPC – Mac OS 8.1

Detailed Development Plan

Introduction

This modification consists of an analysis of TechTracS and a series of changes to TechTracS where indicated by the analysis. The results of the analysis are contained in this document.

Requirements Definition

This modification is a result of a Work Request from Dianne Cheek of NASA Langley Research Center on November 19, 1998. The Work Request includes:

1. Work Request Document.

Detailed Design

Implementation of this modification is broken down into several components, each of which is described in detail on the following pages. Each construction component, upon completion by the developer must pass a component review as described in Quality Assurance on page 3.

The components are:

- Analysis Report
- Data Conversion – requires construction component review.
- Data Source Validation – requires construction component review.
- Deployment Guidelines
- Operational Guidelines

Analysis Report

The stimulus for this Modification was a series a failures of the AgencyWide TechTracS server. These failures appeared to occur during the time when one or more remote AutoAgents were posting data to the server over the WAN. A preliminary study using a database diagnostic tool (DataCheck) revealed that some indexes had become corrupted with spurious characters. According to ACI Technical Support, indexes corrupted in this manner have been known to cause failures similar to those experienced at AgencyWide. The proposed solution was to perform a scrub of the existing data and implement filters at the point of origin to minimize reoccurrence. The data scrub is described in more detail in the *Data Conversion* component on page 3. The implementation of filters is described in more detail in the *Data Source Validation* component on page 4.

Although the failures were occurring on the AgencyWide server the solution will be applied to each of the Field Center servers since the data is automatically replicated to AgencyWide across the WAN. A final DataCheck analysis will be run at all NASA Field Centers and on the AgencyWide (and NTAS and NTTC) servers to confirm proper operation. DataCheck analyses should be run on a regular schedule as part of a preventative maintenance plan. This is detailed in the *Deployment Guidelines* component of page 5 and in the *Operational Guidelines* component of page 5.

The *Current (FY99.01.xx) Alpha or Text Fields* table on page 7 show those fields in the current database structure that are either alpha or text fields. Alpha fields are further detailed as to their maximum length and whether or not they are indexed.

Appendix C – DataCheck Results on page 20 shows a sample of the output from the database diagnostic tool, DataCheck, after it had scanned a copy of the JPL TechTracS data file. It indicates two types of errors: field contains a gremlin [157] and field contains a bad date [158]. DataCheck explains these in the summary on page 26. DataCheck defines gremlins as those characters whose ASCII value falls in the range 0 – 32 or 218 – 255.

Appendix D – Ascii Usage Analysis on page 36 provides, in a tabular form, the results of a usage analysis performed on actual data from TechTracS data files. The goal of this analysis was twofold: identify examples of gremlins in production and obtain a sample of the valid use of the ASCII character set. The latter goal will form the foundation of a definition of acceptable data in the database. The first table in the ASCII Usage Report (Pages 1 – 5) details the results from analyzing data in alpha fields only. The second table (Pages 6 – 10) details the results from analyzing data in text fields only. The two types of fields were analyzed separately because they may legitimately contain different characters. For example, Carriage Returns are permitted in text fields to indicate end of paragraph. They are not permitted in alpha fields.

Note the discovery of invalid characters in the tables (color-coded in red). In the Alpha Fields table, illegitimate characters were discovered in the low ASCII value range, specifically, the values: 2, 5, 10 (line feed), and 13 (carriage return). Some occurrences of ASCII value 127 (del) were also found. These characters most likely were inserted into TechTracS in one of three ways:

- Accidentally typed by the user, possibly using Control or Alt keys in error.
- Original text was in another application and then copy-pasted into TechTracS.
- Data imported from external source, FACS update for example.

In the upper ASCII value range (above 128), surprisingly few characters were identified. In particular, some use was made of ASCII value 168 (registered trademark), 202 (hard space), and 209 (em dash). A hard space may be employed to ensure that a phrase does not get split when word wrapped. For example, the phrase "4th Dimension" contains a hard space between "4th" and "Dimension" that keeps the two words together.

The Text Fields table reveals a higher incidence of invalid characters in the low ASCII value range. As expected, a large number of carriage returns (13) were found and are used by 4th Dimension as paragraph terminators in text fields. Some line feed characters (10) was discovered, particularly at JSC and MSFC. These probably originated from external applications, which used a carriage return – line feed pair to indicate the end of a line. Some tab characters (9) were also discovered and, although ignored by 4th Dimension for formatting purposes, there may be an argument for permitting them in the text fields. Especially if the text field content is expected to be later extracted into an application which requires the tab character for alignment purposes. All other values in the range 0 – 31 can be considered illegal. Some ASCII value 127 (del) characters are present. In the upper ranges some use is made of special characters, mathematical symbols, etc., that may cause display problems when viewed cross-platform or on web pages generated by TechTracS. All characters above 217 should be considered illegal.

Conclusion

The tables show that there is a legitimate cause for concern and that steps should be taken to correct the problems. Those steps are the correction of existing data and the prevention of erroneous data gaining entry to TechTracS in the future.

Data correction will consist of a data scrubbing method to be executed at all TechTracS databases that will either eliminate unwanted characters or replace them with an acceptable alternative. See the *Data Conversion* component on page 3. Invalid dates should also be repaired at this time. It is thought that the invalid dates were introduced some years ago when data was imported from an external source and the date values were in a non-standard format (dd/mm/yy instead of mm/dd/yy). The cause of the problem has since been corrected and all that remains is to repair the damage.

Error prevention will consist of the implementation of data entry filters where data originates from the end user and data scrubbing/conversion methods employed where data is imported or loaded from other sources. Two classes of data entry filters will be developed: one for alpha fields and one, less restrictive, filter for text fields. There are instances where alpha fields are populated from text fields. In these cases additional conversion methods will be utilized to ensure that the resulting alpha field data meets the more restrictive guidelines. See the *Data Source Validation* component on page 4.

After deployment and completion of data scrubbing operations, diagnostic analysis by DataCheck should be repeated at each TechTracS database to ensure satisfactory results.

For data scrubbing and error prevention purposes, lists of acceptable ASCII characters must be defined. These lists will form the basis of parsing routines and data entry filters. The following table defines the approved characters for both alpha fields and text fields:

Field Type	Ascii values	4D Filter	Explanation
Alpha	32 – 217	&" - Ÿ"	Digits 0 – 9, uppercase letters A – Z, lowercase letters a – z, all special characters below ASCII 218 and above ASCII 31
Text	9, 13, 32 – 217	&" - Ÿ; ; "	<Tab>, <carriage return>, digits 0 – 9, uppercase letters A – Z, lowercase letters a – z, all special characters below ASCII 218 and above ASCII 31

Table 1 - Approved ASCII Characters

Note: Text 4D Filter contains a carriage return after the first semi-colon and a tab character after the second semi-colon.

Data Conversion

At the time of deployment a data conversion process will be implemented that will correct existing errors. This consists of:

- Performing a DataCheck *Fix Gremlins* run on each TechTracS data file, dropping indexes and rerunning as indicated by DataCheck.

- Executing the method *ut_Mod61_DataConversion* that will locate invalid characters not discovered by DataCheck and remove them. In addition, it will correct dates fields that contain invalid dates.

Each DataCheck run will record its findings and operations in a log file that will be retained for documentation purposes. DataCheck identifies records in a table by their record number. Users may locate these records by using the special *Query by record number* function in TechTracS: hold down the option (alt) key when choosing *Query Editor* from the Select menu.

The *ut_Mod61_DataConversion* method will examine every record in every table in the data file and perform the following steps for each record:

- ❖ In each alpha field, search for, and remove, characters that are not found in the *Approved Alpha Field Characters* list.

- ❖ In each text field, search for, and remove, characters that are not found in the *Approved Text Field Characters* list.

- ❖ In each date field, test the value of the month and, if greater than 12, swap it for the value of the day.

All database changes will be logged in a text file for documentation purposes.

Two special purpose methods shall be developed called *ut_StandardAlpha* and *ut_StandardText*. They will both accept a pointer parameter that refers to an alpha or text object as appropriate. Their purpose is to parse for and remove any characters that fall outside the approved characters list.

Data Source Validation

Two new data entry filters will be created in the TechTracS Database Properties window, as defined in *Table 1 - Approved ASCII Characters* on page 2.

The *Current (FY99.01.xx) Alpha or Text Fields* table on page 7 lists every alpha field and every text field in the TechTracS structure. The Data Source Validation component of this modification consists of checking each field using 4D Insider, a cross-referencing tool. For each field the following steps will be performed:

- Identify all forms that permit user entry into the field. For each instance, the developer will locate the object in the 4th Dimension development environment and confirm that the appropriate data entry filter is used, updating as necessary.

- Identify all methods, which places data into the field. For each instance, the developer will review the code and verify that the data source does not permit the entry of invalid characters. If it cannot be guaranteed that invalid characters are excluded, the method shall be updated so that the field is post-processed by *ut_StandardAlpha* or *ut_StandardText* as appropriate.

After the field has passed all steps, the responsible developer shall update the entry in the table to indicate its completed status and append his or her initials.

During the process above, the developer shall create a tracking spreadsheet that will record each occurrence of the identified fields and log the developers findings and activity. The spreadsheet will meet Requirement #1, Documentation item #1, and provide source material for the testing plan.

The test plan will be prepared after construction is complete and will be designed to validate that the developer's modifications are correct.

Deployment Guidelines

Due to the complex nature of the modification, careful deployment is critical. A deployment checklist will be developed so that the progress and status of the deployment at each installation can be tracked.

Deployment should consist of the following steps:

- Created a copy of the data file for backup purposes.
- Run DataCheck in evaluation mode and review results with technical support personnel. Save and print the DataCheck log file.
- Run DataCheck in Fix Gremlin mode. DataCheck may recommend dropping one or more indexes. If so this should be done and another Fix Gremlin run should be performed. 4th Dimension will automatically rebuild any dropped indexes at the next launch of the program. Save and print the DataCheck log files.
- Launch the new version of TechTracS in a stand-alone configuration and wait for any indexes to be rebuilt (indicated by a special progress bar). When acquiesced, execute the *ut_Mod61_DataConversion* method to correct final gremlins and any bad dates. Save and print the Mod61_DataConversion log file.
- Re-run DataCheck in evaluation mode and review results with technical support personnel. Save and print the DataCheck log file.

These steps may be redefined if other modifications in the same release have an affect on deployment.

Operational Guidelines

In order to reduce, or at least identify, future incidents of corrupted data. It is recommended that an analysis of each TechTracS data file be performed on a regular basis. DataCheck has a lower cost run-time license that can be used at each TechTracS server to enable a read-only diagnostic analysis similar to the one that provided the data in *Appendix C – DataCheck Results* on page 20.

This analysis should be performed at least monthly and the resulting log file should be printed and saved. The support personnel should review the results of the analysis and report any anomalies to the center DBA.

Guidelines to the DBA detailing the procedures will be developed as a supplement to existing DBA documentation.

Data Interfaces

Current (FY99.01.xx) Alpha or Text Fields

[Table]Field	Type	Status	Developer
[Action Item]Action Taken	Text		
[Action Item]Assigned By	Alpha:20, indexed		
[Action Item]Case Number	Alpha:16, indexed		
[Action Item]Comments	Text		
[Action Item]Follow up Doc	Alpha:5		
[Action Item]Follow up Info	Text		
[Action Item]From	Alpha:25, indexed		
[Action Item]Subject	Text		
[Assignment]Case Number	Alpha:16, indexed		
[BLI]BLI	Alpha:2, indexed		
[BLI]Description	Text		
[Budget]3 Digit UPN	Alpha:3		
[Budget]5 Digit UPN	Alpha:5		
[Budget]7 Digit UPN	Alpha:7		
[Budget]Center	Alpha:5		
[Budget]Description	Text		
[Budget]Task Number	Alpha:2		
[Budget]Title	Text		
[CG Chronology]Contract Number	Alpha:25, indexed		
[CG Chronology]Detail	Text		
[CG Chronology]Document Code	Alpha:5		
[CG Chronology]Type	Alpha:2		
[COG]COG	Alpha:3, indexed		
[COG]Description	Text		
[Company Chrono]Detail	Text		
[Company]Annual Sales	Alpha:20		
[Company]Area Code	Alpha:3		
[Company]Business Type	Alpha:2		
[Company]Country	Alpha:35		
[Company]Division	Text		
[Company]Emps Locally	Alpha:10		
[Company]Extension	Alpha:6		
[Company]FAX Area Code	Alpha:3		
[Company]FAX Number	Alpha:7		
[Company]HQ Address	Text		
[Company]HQ City	Alpha:28, indexed		
[Company]HQ State	Alpha:2, indexed		
[Company]HQ Zip	Alpha:10		
[Company]Name	Alpha:60, indexed		
[Company]Ownership	Alpha:25		
[Company]Phone	Alpha:7		
[Company]POP Address	Text		
[Company]POP City	Alpha:28, indexed		
[Company]POP State	Alpha:2, indexed		
[Company]POP Zip	Alpha:10, indexed		
[Company]Product Line	Alpha:25		
[Company]SIC Code	Alpha:6		
[Confirm_License]Case Number	Alpha:16, indexed		
[Congress]Address	Alpha:40		
[Congress]Area Code	Alpha:3		
[Congress]First Name	Alpha:20		
[Congress]Last Name	Alpha:20		
[Congress]Party Affiliation	Alpha:20		
[Congress]Phone	Alpha:7		
[Congress]State	Alpha:2, indexed		
[Congressional Districts]City	Alpha:28		

[Table]Field	Type	Status	Developer
[Congressional Districts]State	Alpha:2		
[Congressional Districts]Zipcode	Alpha:5, indexed		
[Constants]Action Doc	Alpha:10		
[Constants]Actioner	Alpha:25		
[Constants]CG Prefix	Alpha:10		
[Constants]Default Zone	Alpha:30		
[Constants]EM Account Name	Alpha:31		
[Constants]EM Password	Alpha:13		
[Constants]EM POP3 Host	Alpha:31		
[Constants]EM SMTP Host	Alpha:31		
[Constants]EM Unused 1	Alpha:31		
[Constants]EM Unused 2	Alpha:31		
[Constants]EnvPrint Driver	Alpha:30		
[Constants]EnvPrint Name	Alpha:30		
[Constants]EnvPrint Type	Alpha:30		
[Constants]EnvPrint Zone	Alpha:30		
[Constants]Field Center Zip Code	Alpha:5		
[Constants]HTTP Path	Text		
[Constants]Imp Volume	Alpha:20		
[Constants]Installation	Alpha:60		
[Constants]Mosiac Ref	Text		
[Constants]NextCase	Alpha:20		
[Constants]ODBC_DB	Alpha:12		
[Constants]ODBC_IP	Alpha:12		
[Constants]ODBC_PWD	Alpha:20		
[Constants]ODBC_USER	Alpha:20		
[Constants]Partnership Yr	Alpha:4		
[Constants]Printer Driver	Alpha:30		
[Constants]Printer Name	Alpha:30		
[Constants]Printer Type	Alpha:30		
[Constants]Printer Zone	Alpha:30		
[Constants]Site Address	Text		
[Constants]Site Code	Alpha:4		
[Constants]Site Name	Alpha:30		
[Constants]TechAlertMsg	Text		
[Constants]TOPS Objective	Text		
[Constants]TTO Mail Stop	Alpha:10		
[Constants]TTO Name	Alpha:40		
[Constants]TTO Phone	Alpha:20		
[Constants]TTO Title	Alpha:70		
[Constants]Version	Alpha:10		
[Constants]WAN_NetComp	Alpha:10		
[Constants]WAN_Server1	Alpha:40		
[Constants]WAN_Server2	Alpha:40		
[Contract Reports]Contract Number	Alpha:25, indexed		
[Contract Reports]Report Text	Text		
[Contract Reports]Report Year	Alpha:4, indexed		
[Contract Reports]Type	Alpha:20		
[Contract Stats]Month	Alpha:20		
[Contract Stats]User	Alpha:70		
[Contract Stats]Year	Alpha:20		
[Contract_Grant]Center	Alpha:4, indexed		
[Contract_Grant]Closeout Problem	Alpha:2		
[Contract_Grant]Contract Grant Abstract	Text		
[Contract_Grant]Contract Grant Org Code	Alpha:10		
[Contract_Grant]Contract Number	Alpha:25, indexed		
[Contract_Grant]Contract Type	Alpha:30		
[Contract_Grant]Contract_Grant Title	Text		
[Contract_Grant]FACP CN	Alpha:11, indexed		
[Contract_Grant]FACP Kind	Alpha:2		
[Contract_Grant]Kind of Contract or Grant	Alpha:35		
[Contract_Grant]SBIR_STTR Control Number	Alpha:6		

[Table]Field	Type	Status	Developer
[Contract_Grant]SBIR_STTR Program Year	Alpha:4		
[Contract_Grant]SBIR_STTR Proposal Number	Alpha:6		
[Contract_Grant]SBIR_STTR Purchase Request Nbr	Alpha:8		
[Contract_Grant]SBIR_STTR Subtopic	Alpha:2		
[Contract_Grant]SBIR_STTR Topic	Alpha:2		
[Contract_Grant]Service_Product	Alpha:4		
[Contract_Grant]SIC Code	Alpha:6		
[Contract_Grant]Status	Text		
[Deliverables]3 Digit UPN	Alpha:3		
[Deliverables]5 Digit UPN	Alpha:5		
[Deliverables]7 Digit UPN	Alpha:7		
[Deliverables]Center	Alpha:5		
[Deliverables]Deliverable	Text		
[Deliverables]FY	Alpha:4		
[Deliverables]Quarter	Alpha:2		
[Deliverables]Task Number	Alpha:2		
[Documents]Code	Alpha:5, indexed		
[Documents]Email Text	Text		
[Documents]Paper Size	Alpha:2		
[Documents]Title	Alpha:80		
[Enclosures]Code or Report	Alpha:20		
[Enclosures]Code	Alpha:5, indexed		
[External_Application_Usage]Key	Alpha:20		
[External_Application_Usage]User_Code	Alpha:20		
[Foreign Filing]Action	Text		
[Foreign Filing]Case Number	Alpha:16, indexed		
[Foreign Filing]Country	Alpha:25		
[FY Budget Cost]3 Digit UPN	Alpha:3		
[FY Budget Cost]5 Digit UPN	Alpha:5		
[FY Budget Cost]7 Digit UPN	Alpha:7		
[FY Budget Cost]Center	Alpha:4		
[FY Budget Cost]FY	Alpha:4		
[FY Budget Cost]Task Number	Alpha:2		
[Inquiry]Case Number	Alpha:16, indexed		
[Inquiry]Year	Alpha:4		
[Inventory]3 Digit UPN	Alpha:3, indexed		
[Inventory]5 Digit UPN	Alpha:5, indexed		
[Inventory]7 Digit UPN	Alpha:11, indexed		
[Inventory]Center	Alpha:4, indexed		
[Inventory]Commrcl Assess	Alpha:2, indexed		
[Inventory]Comrcl Plans	Text		
[Inventory]Contract Number	Alpha:25, indexed		
[Inventory]COTR	Alpha:35		
[Inventory]FACP CN	Alpha:11, indexed		
[Inventory]FPN	Alpha:4, indexed		
[Inventory]Funding Source	Alpha:2		
[Inventory]Partnr Todate	Alpha:2		
[Inventory]Program Office	Alpha:2, indexed		
[Inventory]Tech Descriptio	Text		
[KeyCompany]Word	Alpha:45, indexed		
[KeyContract]Word	Alpha:45, indexed		
[KeyPartnership]Word	Alpha:45, indexed		
[KeyPeople]Word	Alpha:45, indexed		
[KeySuccess]Word	Alpha:45, indexed		
[KeyTechnology]Word	Alpha:45, indexed		
[KeyTOPS]Word	Alpha:45, indexed		
[Lead Chronology]Detail	Text		
[Lead Chronology]Lead Number	Alpha:12		
[Lead Chronology]Type	Alpha:2		
[LeRC Eval]Case Number	Alpha:16, indexed		
[LeRC Eval]Comment	Text		
[LeRC Eval]Evaluator	Alpha:10		

[Table]Field	Type	Status	Developer
[LeRC Eval]Vote	Alpha:8		
[License Chronology]Detail	Text		
[License Chronology]Document Code	Alpha:5		
[License Chronology]License App	Alpha:10		
[License Chronology]Type	Alpha:3		
[License Milestones Chronology]Notes	Text		
[License Milestones]Activity Description	Text		
[License Milestones]How Verified	Text		
[License Milestones]Last Update by	Alpha:25		
[License Milestones]Number	Alpha:20		
[License Milestones]Period	Alpha:10		
[License Reports Content]Item	Alpha:80		
[License Reports Content]Report Code	Alpha:6		
[License Reports Content]Units	Alpha:12		
[License Reports]Comments	Text		
[License Reports]Report Number	Alpha:20		
[License Royalties]Center	Alpha:20, indexed		
[License Royalties]Code	Alpha:7		
[License Royalties]Description	Text		
[License Royalties]License App	Alpha:10		
[License Royalty Distribution]License App	Alpha:10		
[License Royalty Distribution]Recipient Type	Alpha:12		
[License Royalty Recipients]Recipient Type	Alpha:12		
[License Technologies]Case No	Alpha:16, indexed		
[License Technologies]License App	Alpha:10		
[License]Center	Alpha:4		
[License]Fed Reg Publicaiton Vol_No	Alpha:10		
[License]License App	Alpha:10, indexed		
[License]License Number	Alpha:7, indexed		
[License]License Type	Alpha:2		
[License]Nature of Exclusivity	Text		
[License]Practical Application	Text		
[License]Subseq Fed Req Publication Vol_	Alpha:10		
[License]Title	Text		
[License]Units	Alpha:12		
[List]Item	Alpha:60, indexed		
[List]Name	Alpha:20, indexed		
[Maintenance Fee]Code	Alpha:4, indexed		
[Maintenance Fee]Description	Alpha:30		
[Maintenance Fee]Exp Months	Alpha:20		
[Multimedia]Caption	Alpha:60		
[Multimedia]Key	Alpha:20, indexed		
[Multimedia]MovieFileName	Alpha:30		
[Multimedia]Tag	Alpha:10		
[Multimedia]Type	Alpha:4		
[NASA Leads]Awareness Comments	Alpha:20		
[NASA Leads]Awareness	Alpha:30		
[NASA Leads]Center	Alpha:4		
[NASA Leads]Comments	Text		
[NASA Leads]Confirmation Stage	Text		
[NASA Leads]Lead Number	Alpha:12		
[NASA Leads]Legal Document	Alpha:25		
[NASA Leads]Partnership Chance	Alpha:9		
[NASA Leads]Partnership Type	Alpha:25		
[NASA Leads]Problem Stage	Text		
[NASA Leads]Qualification	Alpha:6		
[NASA Leads]Result	Alpha:25		
[NASA Tech Leads]Case Number	Alpha:16		
[Other Contracts]Case Number	Alpha:16, indexed		
[Other Contracts]Clause	Alpha:20		
[Other Contracts]Contract No	Alpha:25		
[Other Contracts]Contract Task	Alpha:14		

[Table]Field	Type	Status	Developer
[Other Contracts]Name	Alpha:50		
[Other Contracts]Note	Text		
[Other Contracts]NT Report Number	Alpha:12		
[Other Contracts]Work Order Number	Alpha:12		
[Outside Patent Preparation]Action	Text		
[Outside Patent Preparation]Case Number	Alpha:16, indexed		
[Partners FY]FY	Alpha:4		
[Partnership Assistance]Assistance	Alpha:25		
[Partnership Chronology]Detail	Text		
[Partnership Chronology]Type	Alpha:3		
[Partnership NTIS]NTIS	Alpha:4		
[Partnership Org Codes]Org Code	Alpha:10		
[Partnership SIC]SIC	Alpha:45		
[Partnership UPN_FPN FY]FY	Alpha:4		
[Partnership UPN_FPN]FPN	Alpha:4		
[Partnership UPN_FPN]UPN	Alpha:7		
[Partnerships]Arrangement	Alpha:30		
[Partnerships]Center Unique Number	Alpha:15		
[Partnerships]Center	Alpha:4		
[Partnerships]Commercial Practice	Alpha:35		
[Partnerships]Last Action	Text		
[Partnerships]Partnership Abstract	Text		
[Partnerships]Partnership Number	Alpha:25, indexed		
[Partnerships]Partnership Title	Text		
[Partnerships]Program Area	Alpha:10		
[Partnerships]Related Contract Number	Alpha:25, indexed		
[Partnerships]Status	Alpha:13		
[Partnerships]Type	Alpha:30		
[PAT Statistics]Site	Alpha:8, indexed		
[PAT Stats Month]Site	Alpha:8		
[People Chrono]Detail	Text		
[People Chrono]Document Code	Alpha:5		
[People Chrono]Region	Alpha:20		
[People Chrono]Type	Alpha:2		
[People]Address	Text		
[People]Area Code	Alpha:3		
[People]Bachelor	Alpha:30		
[People]City	Alpha:28		
[People]Dept	Alpha:50		
[People]Doctorate	Alpha:30		
[People]EMail Address	Alpha:69, indexed		
[People]Expertise	Alpha:30		
[People]Extension	Alpha:6		
[People]External User Key	Alpha:4, indexed		
[People]External User Password	Alpha:10		
[People]FAX Area Code	Alpha:3		
[People]FAX Number	Alpha:7		
[People]First Name	Alpha:20		
[People]Home Address	Text		
[People]Home AreaCode	Alpha:3		
[People]Home City	Alpha:20		
[People]Home Phone	Alpha:7		
[People]Home State	Alpha:2		
[People]Home Zip	Alpha:10		
[People]INS 1551 Number	Alpha:21		
[People]Job Function	Alpha:20		
[People]KeywordText	Text		
[People]Last Name	Alpha:30, indexed		
[People]Mail Code	Alpha:10		
[People]Master	Alpha:30		
[People]MI	Alpha:12		
[People]Org Code	Alpha:10		

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[Process]ParType7	Alpha:2		
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[Process]Printer Zone	Alpha:30		
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[Publication]Volume Number	Alpha:10		
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[Shadow]Disposition	Alpha:21		
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[Success Story Assoc Docs]Title	Alpha:60		
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[xInvSIC]SIC Code	Alpha:6, indexed		
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[xTechNTIS]NTIS Code	Alpha:4, indexed		
[xTechSIC]SIC Code	Alpha:6, indexed		
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[xWAN Post]NTTC Status	Alpha:2, indexed		
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[xWebData]Search	Text		
[xWebData]State	Alpha:20		
[xWebData]SuccessSet	Text		
[xWebData]TechnologySet	Text		
[xWebData]TOPSSet	Text		

Appendix A – Mod Review Notes

Mod: **61 – Data Analysys/Preventative Maintenance Plan:**

Participants: Simon Wright/KSS, Dianne Cheek/LaRC

Estimate Update:

4/9/99 - **The adjustment increase of 75 hours to the overall mod estimate**

Outstanding Issues:

Issue Table:

Description	Date	New Req'ts (Yes, No, N/A)	Impact (0, 1, 2) 1= < 2 hrs 2= > 2 hrs
(1) Eliminate the following tables from the construction phase in order to reduce overall effort: Process, Shadow, sparexxx, User, and all x files except xKeywords and xWebData. **Resolution:** OK	4/9/99	Y	0
(2) Widen alpha and text filters to allow all characters except those in range 0-31 and 218-255. Text fields will allow tab and carriage-return. **Resolution:** OK	4/9/99	N	1

Appendix B – Programming Standards

Naming Conventions

The module prefix for this modification is UT. All objects created in the execution of this modification will utilize this prefix as indicated in the *4th Dimension Coding and Structure Rules* document maintained by the developer.

Appendix C – DataCheck Results

```
ARC_TechTracS.data copy - 3/17/99, 11:13 AM [Mac v1.5b6]
    Tables:
        [Structure]
            Warning: Record 716: field [Structure]Full Name contains a gremlin: 'Home address. For
            example:4909 Windy H' [157]
            Warning: Record 1136: field [Structure]Full Name contains a gremlin: 'Commercial
            Activities:Mark “Yes”, “No”' [157]
            Warning: Record 1139: field [Structure]Full Name contains a gremlin: 'Social / Economic
            Benefits For a "Spin-o' [157]
        [xKeywords]
            Warning: Record 1833: field [xKeywords]Word contains a gremlin: 'SYSTEM' [157]
            Warning: Record 3527: field [xKeywords]Word contains a gremlin: 'D isclosure' [157]
            Warning: Record 3780: field [xKeywords]Word contains a gremlin: 'Networks' [157]
            Warning: Record 3808: field [xKeywords]Word contains a gremlin: 'Weightlessness' [157]
            Warning: Record 4121: field [xKeywords]Word contains a gremlin: 'System (Includes' [157]
            Warning: Record 8339: field [xKeywords]Word contains a gremlin: 'Temperatures or KevLar'
            [157]
            Warning: Record 10069: field [xKeywords]Word contains a gremlin: 'CENTER AND' [157]
            Warning: Record 10107: field [xKeywords]Word contains a gremlin: 'OBJECT' [157]
            Warning: Record 10184: field [xKeywords]Word contains a gremlin: 'Testing' [157]
            Warning: Record 10197: field [xKeywords]Word contains a gremlin: 'Controller' [157]
            Warning: Record 10198: field [xKeywords]Word contains a gremlin: 'Or Turbofan' [157]
            Warning: Record 10208: field [xKeywords]Word contains a gremlin: 'Insulation' [157]
            Warning: Record 10293: field [xKeywords]Word contains a gremlin: 'Device (old.' [157]
            Warning: Record 10301: field [xKeywords]Word contains a gremlin: 'Slipring (old' [157]
            Warning: Record 10310: field [xKeywords]Word contains a gremlin: 'Displays (old' [157]
            Warning: Record 10318: field [xKeywords]Word contains a gremlin: 'Spacecraft (old' [157]
            Warning: Record 10327: field [xKeywords]Word contains a gremlin: 'System (old' [157]
            Warning: Record 10340: field [xKeywords]Word contains a gremlin: 'Design (old' [157]
            Warning: Record 10372: field [xKeywords]Word contains a gremlin: 'Systems' [157]
            Warning: Record 13936: field [xKeywords]Word contains a gremlin: 'Code' [157]
            Warning: Record 13955: field [xKeywords]Word contains a gremlin: 'ABLATORS' [157]
            Warning: Record 14175: field [xKeywords]Word contains a gremlin: 'Component' [157]
            Warning: Record 14185: field [xKeywords]Word contains a gremlin: 'Center' [157]
            Warning: Record 14205: field [xKeywords]Word contains a gremlin: 'DEVICES' [157]
            Warning: Record 14227: field [xKeywords]Word contains a gremlin: 'System02' [157]
            Warning: Record 14263: field [xKeywords]Word contains a gremlin: 'Oven' [157]
            Warning: Record 14292: field [xKeywords]Word contains a gremlin: 'Flow Do' [157]
            Warning: Record 14296: field [xKeywords]Word contains a gremlin: 'Blade' [157]
            Warning: Record 14308: field [xKeywords]Word contains a gremlin: 'CeramicsContract' [157]
            Warning: Record 14310: field [xKeywords]Word contains a gremlin: 'CeramicsDisclosure'
            [157]
            Warning: Record 14314: field [xKeywords]Word contains a gremlin: 'Radiation' [157]
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            Warning: Record 14334: field [xKeywords]Word contains a gremlin: 'No.12139-1) Put' [157]
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            Warning: Record 14452: field [xKeywords]Word contains a gremlin: 'TactionDis.' [157]
            Warning: Record 14457: field [xKeywords]Word contains a gremlin: 'Source) Disc.' [157]
            Warning: Record 14483: field [xKeywords]Word contains a gremlin: 'Laser(Formerly:' [157]
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        ' [157]
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            Warning: Record 14921: field [xKeywords]Word contains a gremlin: 'FluidPCT' [157]
            Warning: Record 14930: field [xKeywords]Word contains a gremlin: 'NASA ' [157]
            Warning: Record 15092: field [xKeywords]Word contains a gremlin: 'FluidEPO' [157]
            Warning: Record 15097: field [xKeywords]Word contains a gremlin: 'PumpNow' [157]
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            Warning: Record 15246: field [xKeywords]Word contains a gremlin: 'Exchange' [157]
            Warning: Record 15378: field [xKeywords]Word contains a gremlin: 'Facility #' [157]
            Warning: Record 15381: field [xKeywords]Word contains a gremlin: 'Drives Old' [157]
```

```
    Warning: Record 15489: field [xKeywords]Word contains a gremlin: 'Resonance (old' [157]
    Warning: Record 15540: field [xKeywords]Word contains a gremlin: 'Microgravity' [157]
    Warning: Record 15710: field [xKeywords]Word contains a gremlin: 'GridRefer' [157]
    Warning: Record 15715: field [xKeywords]Word contains a gremlin: ' Uptake' [157]
    Warning: Record 15716: field [xKeywords]Word contains a gremlin: 'ExerciseRefer' [157]
    Warning: Record 15859: field [xKeywords]Word contains a gremlin: 'Generator' [157]
    Warning: Record 15861: field [xKeywords]Word contains a gremlin: 'Taction Dis.' [157]
    Warning: Record 15868: field [xKeywords]Word contains a gremlin: 'Aircraft' [157]
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    Warning: Record 16051: field [xKeywords]Word contains a gremlin: 'Applications' [157]
    Warning: Record 16083: field [xKeywords]Word contains a gremlin: 'Re search' [157]
    Warning: Record 16087: field [xKeywords]Word contains a gremlin: 'HARNESS' [157]
    Warning: Record 16095: field [xKeywords]Word contains a gremlin: '' [157]
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    Warning: Record 1219: field [Contract_Grant]SpareFM NASA Org contains a gremlin: 'D'
    [157]
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    Clause to CCR
' [157]
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    Warning: Record 220: field [Technology]Patent Expiration Dt contains a bad date:
    '12/30/1903' [158]
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Warning: Record 221: field [Technology]Patent Expiration Dt contains a bad date:
'5/26/1904' [158]
Warning: Record 289: field [Technology]Application Filing Dt contains a bad date:
'5/23/1986' [158]
Warning: Record 293: field [Technology]Patent Expiration Dt contains a bad date:
'8/30/1905' [158]
Warning: Record 298: field [Technology]Application Filing Dt contains a bad date:
'11/29/1988' [158]
Warning: Record 448: field [Technology]Application Filing Dt contains a bad date:
'6/21/1989' [158]
Warning: Record 467: field [Technology]Application Filing Dt contains a bad date:
'1/29/1988' [158]
Warning: Record 476: field [Technology]Patent Expiration Dt contains a bad date:
'9/18/1907' [158]
Warning: Record 1732: field [Technology]Patent Expiration Dt contains a bad date:
'12/27/1994' [158]
Warning: Record 1733: field [Technology]Patent Expiration Dt contains a bad date:
'12/22/1987' [158]
Warning: Record 1733: field [Technology]Patent Issue Date contains a bad date:
'12/22/1970' [158]
Warning: Record 1734: field [Technology]Application Filing Dt contains a bad date:
'3/20/1968' [158]
Warning: Record 1736: field [Technology]Patent Expiration Dt contains a bad date:
'9/14/1988' [158]
Warning: Record 1738: field [Technology]Patent Expiration Dt contains a bad date:
'7/13/1988' [158]
Warning: Record 1738: field [Technology]Patent Issue Date contains a bad date:
'7/13/1971' [158]
Warning: Record 1739: field [Technology]Patent Expiration Dt contains a bad date:
'4/28/1987' [158]
Warning: Record 1739: field [Technology]Application Filing Dt contains a bad date:
'10/16/1967' [158]
Warning: Record 1739: field [Technology]Patent Issue Date contains a bad date:
'4/28/1970' [158]
Warning: Record 1742: field [Technology]Patent Expiration Dt contains a bad date:
'12/22/1987' [158]
Warning: Record 1742: field [Technology]Patent Issue Date contains a bad date:
'12/22/1970' [158]
Warning: Record 1743: field [Technology]Patent Expiration Dt contains a bad date:
'10/20/1987' [158]
Warning: Record 1743: field [Technology]Patent Issue Date contains a bad date:
'10/20/1970' [158]
Warning: Record 1744: field [Technology]Patent Expiration Dt contains a bad date:
'12/29/1987' [158]
Warning: Record 1744: field [Technology]Patent Issue Date contains a bad date:
'12/29/1970' [158]
Warning: Record 1745: field [Technology]Patent Expiration Dt contains a bad date:
'6/28/1988' [158]
Warning: Record 1745: field [Technology]Application Filing Dt contains a bad date:
'1/24/1969' [158]
Warning: Record 1745: field [Technology]Patent Issue Date contains a bad date:
'6/28/1971' [158]
Warning: Record 1748: field [Technology]Patent Expiration Dt contains a bad date:
'5/18/1988' [158]
Warning: Record 1748: field [Technology]Application Filing Dt contains a bad date:
'10/23/1968' [158]
Warning: Record 1748: field [Technology]Patent Issue Date contains a bad date:
'5/18/1971' [158]
Warning: Record 1749: field [Technology]Application Filing Dt contains a bad date:
'3/19/1969' [158]
Warning: Record 1752: field [Technology]Patent Expiration Dt contains a bad date:
'11/16/1988' [158]
Warning: Record 1753: field [Technology]Application Filing Dt contains a bad date:
'2/13/1969' [158]
Warning: Record 1754: field [Technology]Patent Expiration Dt contains a bad date:
'4/18/1989' [158]
Warning: Record 1755: field [Technology]Patent Expiration Dt contains a bad date:
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'10/20/1970' [158]
Warning: Record 1757: field [Technology]Patent Expiration Dt contains a bad date:
'11/16/1988' [158]
Warning: Record 1758: field [Technology]Patent Expiration Dt contains a bad date:
'6/13/1989' [158]
Warning: Record 1759: field [Technology]Patent Expiration Dt contains a bad date:
'11/30/1988' [158]
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Warning: Record 1761: field [Technology]Patent Expiration Dt contains a bad date:
'11/30/1988' [158]
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'11/13/1990' [158]
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'11/16/1988' [158]
Warning: Record 1763: field [Technology]Application Filing Dt contains a bad date:
'2/27/1970' [158]
Warning: Record 1763: field [Technology]Patent Issue Date contains a bad date:
'11/16/1971' [158]
Warning: Record 1765: field [Technology]Patent Expiration Dt contains a bad date:
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Warning: Record 1767: field [Technology]Patent Expiration Dt contains a bad date:
'11/16/1988' [158]
Warning: Record 1768: field [Technology]Patent Expiration Dt contains a bad date:
'1/30/1990' [158]
Warning: Record 1770: field [Technology]Patent Expiration Dt contains a bad date:
'10/19/1988' [158]
Warning: Record 1771: field [Technology]Patent Expiration Dt contains a bad date:
'1/25/1989' [158]
Warning: Record 1772: field [Technology]Patent Expiration Dt contains a bad date:
'4/24/1990' [158]
Warning: Record 1776: field [Technology]Patent Expiration Dt contains a bad date:
'7/25/1989' [158]
Warning: Record 1777: field [Technology]Patent Expiration Dt contains a bad date:
'2/17/1993' [158]
Warning: Record 1778: field [Technology]Patent Expiration Dt contains a bad date:
'5/16/1989' [158]
Warning: Record 1779: field [Technology]Patent Expiration Dt contains a bad date:
'9/18/1990' [158]
Warning: Record 1779: field [Technology]Patent Issue Date contains a bad date:
'9/18/1973' [158]
Warning: Record 1781: field [Technology]Patent Expiration Dt contains a bad date:
'10/24/1989' [158]
Warning: Record 1782: field [Technology]Patent Expiration Dt contains a bad date:
'3/18/1992' [158]
Warning: Record 1783: field [Technology]Patent Expiration Dt contains a bad date:
'8/14/1990' [158]
Warning: Record 1783: field [Technology]Patent Issue Date contains a bad date:
'8/14/1973' [158]
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'5/13/1992' [158]
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'9/16/1992' [158]
Warning: Record 1791: field [Technology]Patent Expiration Dt contains a bad date:
'8/31/1993' [158]
Warning: Record 1795: field [Technology]Patent Expiration Dt contains a bad date:
'11/26/1991' [158]
Warning: Record 1796: field [Technology]Patent Expiration Dt contains a bad date:
'8/20/1991' [158]
Warning: Record 1797: field [Technology]Patent Expiration Dt contains a bad date:
'6/25/1991' [158]
Warning: Record 1798: field [Technology]Patent Expiration Dt contains a bad date:
'8/14/1990' [158]
Warning: Record 1799: field [Technology]Patent Expiration Dt contains a bad date:
'11/13/1990' [158]
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'11/26/1991' [158]
Warning: Record 1805: field [Technology]Patent Expiration Dt contains a bad date:
'7/27/1993' [158]
Warning: Record 1806: field [Technology]Application Filing Dt contains a bad date:
'12/22/1971' [158]
Warning: Record 1807: field [Technology]Patent Expiration Dt contains a bad date:
'3/19/1991' [158]
Warning: Record 1809: field [Technology]Patent Expiration Dt contains a bad date:
'7/27/1993' [158]
Warning: Record 1811: field [Technology]Patent Expiration Dt contains a bad date:
'6/22/1993' [158]
Warning: Record 1812: field [Technology]Patent Expiration Dt contains a bad date:
'6/28/1991' [158]
Warning: Record 1813: field [Technology]Patent Expiration Dt contains a bad date:
'5/14/1991' [158]
Warning: Record 1815: field [Technology]Patent Expiration Dt contains a bad date:
'6/18/1991' [158]
Warning: Record 1817: field [Technology]Patent Expiration Dt contains a bad date:
'6/24/1992' [158]
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    Too many errors of type [158].  (max: 100)
[Tech Chronology]
    Warning: Record 9521: field [Tech Chronology]Item Date contains a bad date: '8/28/1986'
    [158]
[Multimedia]
    Warning: Record 74: field [Multimedia]Caption contains a gremlin: 'Optically Leveraged
     Beam Aligner' [157]
[Inventory]
    Warning: Record 2791: field [Inventory]spareCOTR Phone contains a gremlin: '000' [157]
    Warning: Record 3444: field [Inventory]Contract Number contains a gremlin: 'FAA-91-1-001
    (MOA #) DTFA' [157]
[Partnerships]
    Warning: Record 1242: field [Partnerships]Partnership Number contains a gremlin: 'FAA-91-
    1-001 (MOA #) DTFA' [157]
[Partners]
    Warning: Record 1245: field [Partners]spareContract Number contains a gremlin: 'FAA-91-1-
    001 (MOA #) DTFA' [157]
    Warning: Record 2012: field [Partners]spareContract Number contains a gremlin: 'FAA-91-1-
    001 (MOA #) DTFA' [157]
[KeyContract]
    Warning: Record 197: field [KeyContract]Word contains a gremlin: 'Weightlessness
' [157]
    Warning: Record 1877: field [KeyContract]Word contains a gremlin: 'Code' [157]
    Warning: Record 4812: field [KeyContract]Word contains a gremlin: 'SYSTEM' [157]
    Warning: Record 9211: field [KeyContract]Word contains a gremlin: 'Testing' [157]
    Warning: Record 10287: field [KeyContract]Word contains a gremlin: 'ABLATORS' [157]
    Warning: Record 13885: field [KeyContract]Word contains a gremlin: 'Component' [157]
    Warning: Record 13924: field [KeyContract]Word contains a gremlin: 'Center' [157]
    Warning: Record 14148: field [KeyContract]Word contains a gremlin: 'System 02' [157]
    Warning: Record 14266: field [KeyContract]Word contains a gremlin: '(ERAST)' [157]
    Warning: Record 14389: field [KeyContract]Word contains a gremlin: 'Blade' [157]
    Warning: Record 15629: field [KeyContract]Word contains a gremlin: 'X YPLOT' [157]
    Warning: Record 16344: field [KeyContract]Word contains a gremlin: 'Insulation' [157]
    Warning: Record 16666: field [KeyContract]Word contains a gremlin: 'Systems' [157]
    Warning: Record 16952: field [KeyContract]Word contains a gremlin: 'offices.' [157]
    Warning: Record 16953: field [KeyContract]Word contains a gremlin: 'offices.' [157]
    Warning: Record 17057: field [KeyContract]Word contains a gremlin: 'Microgravitynas2-
    13869
' [157]
    Warning: Record 17194: field [KeyContract]Word contains a gremlin: 'NASA ' [157]
    Warning: Record 18702: field [KeyContract]Word contains a gremlin: 'Company' [157]
    Warning: Record 19896: field [KeyContract]Word contains a gremlin: '1997 ' [157]
    Warning: Record 22241: field [KeyContract]Word contains a gremlin: 'Exchange' [157]
    Warning: Record 22524: field [KeyContract]Word contains a gremlin: 'Analysis' [157]
    Warning: Record 23755: field [KeyContract]Word contains a gremlin: 'CENTER AND' [157]
    Warning: Record 24814: field [KeyContract]Word contains a gremlin: 'D isclosure' [157]
    Warning: Record 29160: field [KeyContract]Word contains a gremlin: 'Applications
' [157]
    Warning: Record 29266: field [KeyContract]Word contains a gremlin: 'Re search' [157]
    Warning: Record 29288: field [KeyContract]Word contains a gremlin: 'HARNESS' [157]
    Warning: Record 29439: field [KeyContract]Word contains a gremlin: '' [157]
[KeyTechnology]
    Warning: Record 11542: field [KeyTechnology]Word contains a gremlin: 'Source) Disc.'
    [157]
    Warning: Record 11887: field [KeyTechnology]Word contains a gremlin: 'Temperatures or
    KevLar' [157]
    Warning: Record 12348: field [KeyTechnology]Word contains a gremlin: 'TactionDis.' [157]
    Warning: Record 12626: field [KeyTechnology]Word contains a gremlin: 'SystemDisclosure'
    [157]
    Warning: Record 13316: field [KeyTechnology]Word contains a gremlin: 'Oven' [157]
    Warning: Record 13839: field [KeyTechnology]Word contains a gremlin: 'No.12139-1) Put'
    [157]
    Warning: Record 14536: field [KeyTechnology]Word contains a gremlin: 'Composites' [157]
    Warning: Record 17273: field [KeyTechnology]Word contains a gremlin: 'Radiation' [157]
    Warning: Record 19025: field [KeyTechnology]Word contains a gremlin: 'CeramicsDisclosure'
    [157]
    Warning: Record 19123: field [KeyTechnology]Word contains a gremlin: 'CeramicsContract'
    [157]
    Warning: Record 19605: field [KeyTechnology]Word contains a gremlin: 'Blade' [157]
    Warning: Record 19686: field [KeyTechnology]Word contains a gremlin: 'Flow Do' [157]
    Warning: Record 21982: field [KeyTechnology]Word contains a gremlin: 'DEVICES' [157]
    Warning: Record 22246: field [KeyTechnology]Word contains a gremlin: 'OBJECT' [157]
    Warning: Record 22679: field [KeyTechnology]Word contains a gremlin: 'Controller
' [157]
    Warning: Record 22680: field [KeyTechnology]Word contains a gremlin: 'Or Turbofan' [157]
    Warning: Record 22741: field [KeyTechnology]Word contains a gremlin: 'Insulation
```

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' [157]
    Warning: Record 23214: field [KeyTechnology]Word contains a gremlin: 'Device (old.' [157]
    Warning: Record 23231: field [KeyTechnology]Word contains a gremlin: 'Slipring (old'
    [157]
    Warning: Record 23275: field [KeyTechnology]Word contains a gremlin: 'Displays (old'
    [157]
    Warning: Record 23307: field [KeyTechnology]Word contains a gremlin: 'Spacecraft
(old' [157]
    Warning: Record 23365: field [KeyTechnology]Word contains a gremlin: 'System old' [157]
    Warning: Record 23388: field [KeyTechnology]Word contains a gremlin: 'Displays (old'
    [157]
    Warning: Record 23408: field [KeyTechnology]Word contains a gremlin: 'Design (old' [157]
    Warning: Record 23469: field [KeyTechnology]Word contains a gremlin: 'Spacecraft
(old' [157]
    Warning: Record 23614: field [KeyTechnology]Word contains a gremlin: 'Systems' [157]
    Warning: Record 29413: field [KeyTechnology]Word contains a gremlin: 'Laser(Formerly:'
    [157]
    Warning: Record 29540: field [KeyTechnology]Word contains a gremlin: 'Ceramics' [157]
    Warning: Record 29783: field [KeyTechnology]Word contains a gremlin: 'Knowledge(Old'
    [157]
    Warning: Record 29832: field [KeyTechnology]Word contains a gremlin: 'Divider' [157]
    Warning: Record 29846: field [KeyTechnology]Word contains a gremlin: '(TSPX)' [157]
    Warning: Record 29877: field [KeyTechnology]Word contains a gremlin: 'FluidNorway' [157]
    Warning: Record 29883: field [KeyTechnology]Word contains a gremlin: 'FluidCanada' [157]
    Warning: Record 29889: field [KeyTechnology]Word contains a gremlin: 'FluidNew' [157]
    Warning: Record 29896: field [KeyTechnology]Word contains a gremlin: 'FluidAustralia'
    [157]
    Warning: Record 29899: field [KeyTechnology]Word contains a gremlin: 'FluidPCT' [157]
    Warning: Record 29966: field [KeyTechnology]Word contains a gremlin: 'FluidEPO' [157]
    Warning: Record 29971: field [KeyTechnology]Word contains a gremlin: 'PumpNow' [157]
    Warning: Record 29976: field [KeyTechnology]Word contains a gremlin: '(Software)' [157]
    Warning: Record 29978: field [KeyTechnology]Word contains a gremlin: 'Ceramics DK2105'
    [157]
    Warning: Record 30200: field [KeyTechnology]Word contains a gremlin: 'Facility #' [157]
    Warning: Record 30205: field [KeyTechnology]Word contains a gremlin: 'Drives Old' [157]
    Warning: Record 30388: field [KeyTechnology]Word contains a gremlin: 'Resonance (old'
    [157]
    Warning: Record 30448: field [KeyTechnology]Word contains a gremlin: 'Microgravity' [157]
    Warning: Record 30638: field [KeyTechnology]Word contains a gremlin: 'Networks' [157]
    Warning: Record 30705: field [KeyTechnology]Word contains a gremlin: 'Disclosure' [157]
    Warning: Record 30706: field [KeyTechnology]Word contains a gremlin: 'Disclosure' [157]
    Warning: Record 30715: field [KeyTechnology]Word contains a gremlin: 'GridRefer' [157]
    Warning: Record 30725: field [KeyTechnology]Word contains a gremlin: ' Uptake' [157]
    Warning: Record 30726: field [KeyTechnology]Word contains a gremlin: 'ExerciseRefer'
    [157]
    Warning: Record 30820: field [KeyTechnology]Word contains a gremlin: '' [157]
    Warning: Record 30867: field [KeyTechnology]Word contains a gremlin: 'Generator' [157]
    Warning: Record 30874: field [KeyTechnology]Word contains a gremlin: 'Taction Dis.' [157]
    Warning: Record 30921: field [KeyTechnology]Word contains a gremlin: 'Aircraft' [157]
    Warning: Record 30950: field [KeyTechnology]Word contains a gremlin: 'Evolution' [157]
[KeyTOPS]
    Warning: Record 43: field [KeyTOPS]Word contains a gremlin: 'Super- Resolved' [157]
    Warning: Record 262: field [KeyTOPS]Word contains a gremlin: 'SystemDisclosure' [157]
    Warning: Record 303: field [KeyTOPS]Word contains a gremlin: 'TactionDis.' [157]
    Warning: Record 312: field [KeyTOPS]Word contains a gremlin: 'TactionDis.' [157]
    Warning: Record 363: field [KeyTOPS]Word contains a gremlin: 'FluidPCT' [157]
    Warning: Record 370: field [KeyTOPS]Word contains a gremlin: 'FluidPCT' [157]
    Warning: Record 395: field [KeyTOPS]Word contains a gremlin: 'FluidNorway' [157]
    Warning: Record 402: field [KeyTOPS]Word contains a gremlin: 'FluidNorway' [157]
    Warning: Record 409: field [KeyTOPS]Word contains a gremlin: 'FluidCanada' [157]
    Warning: Record 416: field [KeyTOPS]Word contains a gremlin: 'FluidCanada' [157]
    Warning: Record 423: field [KeyTOPS]Word contains a gremlin: 'FluidNew' [157]
    Warning: Record 431: field [KeyTOPS]Word contains a gremlin: 'FluidNew' [157]
    Warning: Record 439: field [KeyTOPS]Word contains a gremlin: 'FluidAustralia' [157]
    Warning: Record 446: field [KeyTOPS]Word contains a gremlin: 'FluidAustralia' [157]
    Warning: Record 453: field [KeyTOPS]Word contains a gremlin: 'FluidEPO' [157]
    Warning: Record 460: field [KeyTOPS]Word contains a gremlin: 'FluidEPO' [157]
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```
Summary Statistics:
Elapsed time  : 00:36:20
Node count    : 1117072
Node disk use : 30168k
Nodes Deleted : 2402 (0%)
Record count  : 372214
Rec disk use  : 67309k
Recs Deleted  : 32383 (8%)


****************** Detail Descriptions *********************

Below are detailed descriptions of the items noted above.
The numbers at the end of each item above map to a description below.

************************************************

 [157] Your data contains a gremlin.  Gremlins are characters that are outside of the normal
        range of characters allowed by your script system.  You can change the 'accepted'
        gremlins by choosing 'config' next to the 'Find Gremlins' checkbox.

 [158] Your data contains a poorly formed date.  A date is poorly formed if when viewed with
        the 'mm/dd/yyyy' it contains elements outside of the reasonable range (ie, mm>12).
        NOTE: DataCheck sometimes reports an index as DAMAGED under this condition.
```

Index

Appendix D – Ascii Usage Analysis

The following pages contain the results of an analysis performed on ten NASA TechTracS servers. A 4th Dimension method was developed that was executed against the data file from the centers indicated in the report. The method examined up to 100 records randomly selected from each of the tables in the data file. For each record chosen, the method examined every alpha field and every text field. For each field examined, the method counted the number of times each character in the standard Ascii character set occurred in the field. Those numbers were accumulated into the results shown.

The Ascii characters shaded purple (Ascii values 1 through 31 and 218 through 255) are normally considered as Gremlins in 4th Dimension.

The Ascii characters shaded yellow (Ascii values 160, 165, 173, etc.) are highlighted to indicate that those characters are normally unprintable under Windows, Arial font.

The field center usage counts colored in red are highlighted to indicate the scope of the problem.